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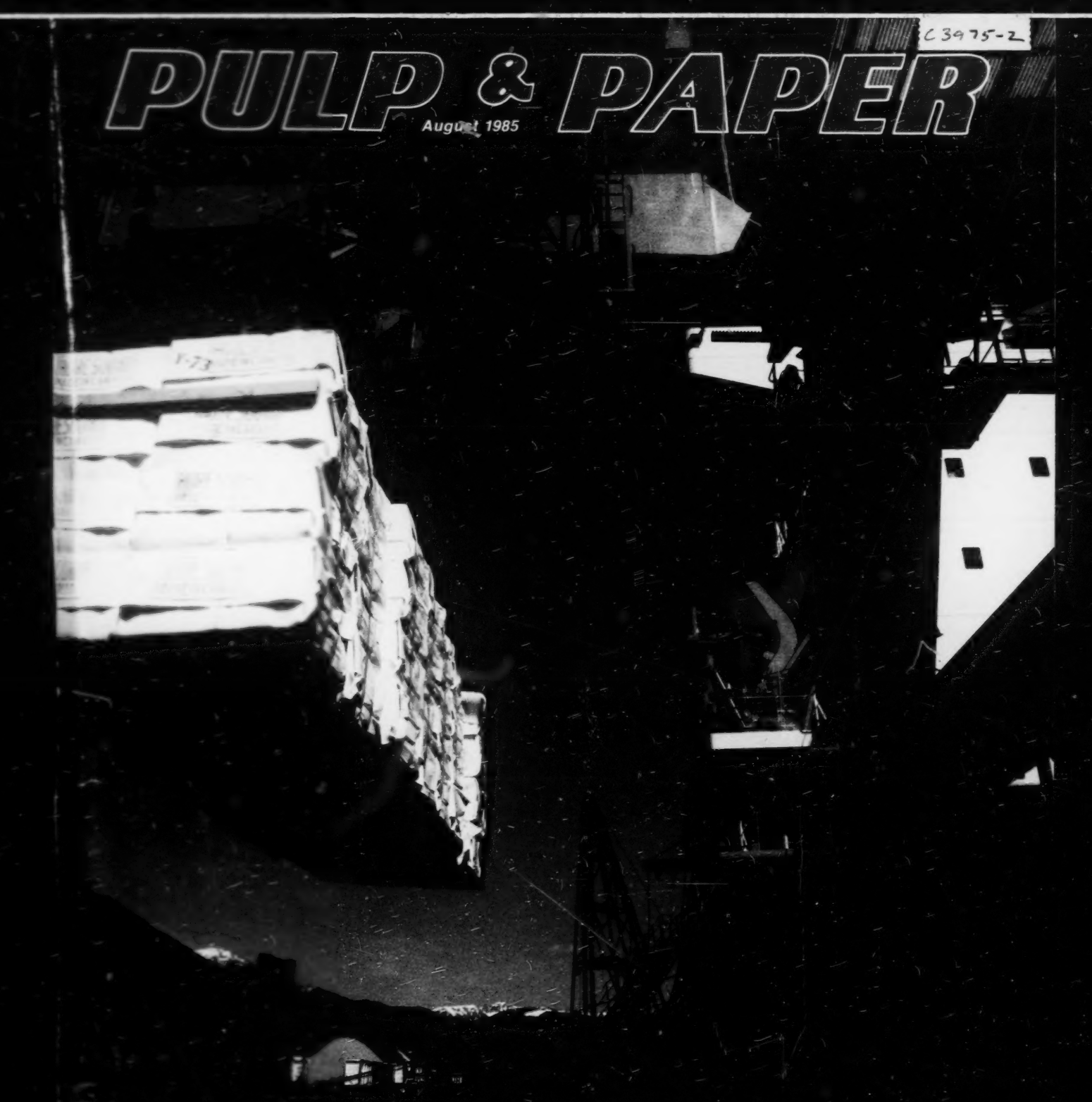
PULP & PAPER

August 1985



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Number 8

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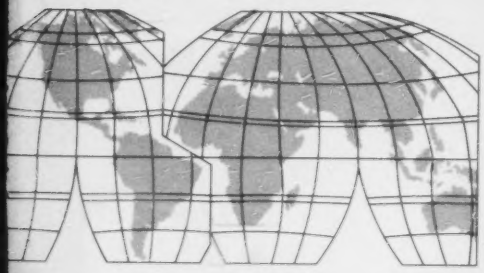

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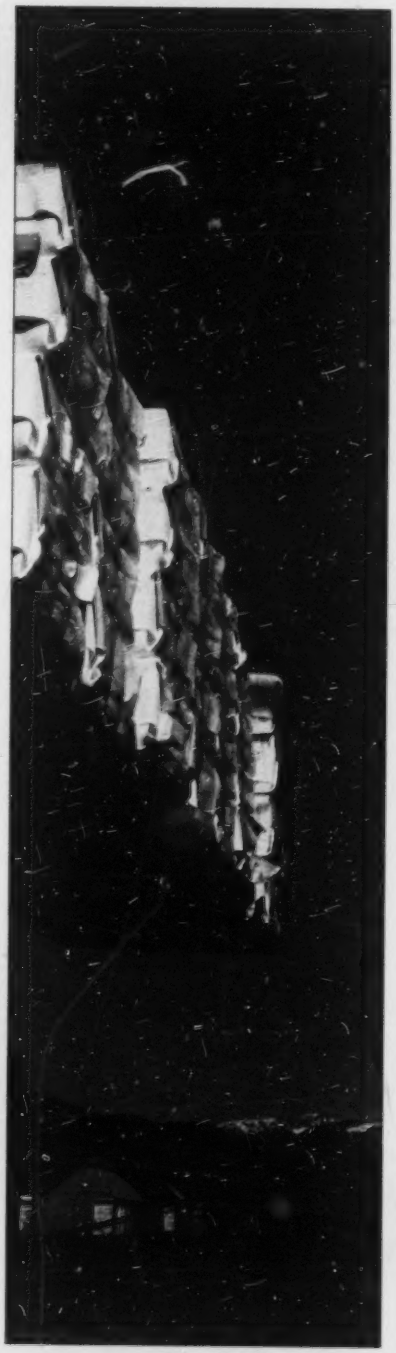

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Market pulp being loaded for export at Canadian Forest Products Ltd.'s Howe Sound Pulp Div., Port Mellon, B.C. (Photo courtesy of Canadian Forest Products Ltd.)

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Office locations

AT = Atlanta: 2700 Cumberland Parkway N.W., Suite 530, Atlanta, Ga. 30339; (404) 432-3186; Telex 275015
SF = San Francisco: 500 Howard St., San Francisco, Calif. 94105; (415) 397-1881; Telex 278273
NY = New York: 370 Lexington Ave., New York, N.Y. 10017; (212) 683-9294; Telex 220442
BR = Brussels: Chaussée de Charleroi 123a, Boîte 5, B-1060, Brussels, Belgium; Telex 846-24672

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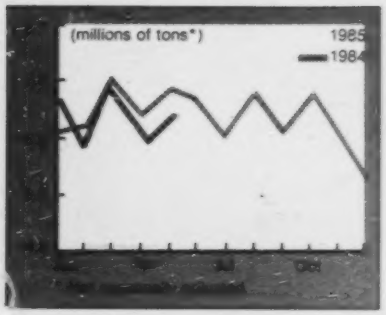
U.S. paper and board production



U.S. production of paper and paperboard totaled 5.68 million tons in May, 4.9% lower than in May 1984, American Paper Institute figures show. The seasonally adjusted rate for January through May stood at 34.1 million tpy for paper, down 0.9% from last year, and 32.5 million tpy for paperboard, down 3.8%. API's two-month moving average is still falling, showing an annual production rate of 64.8 million tons in May. That figure is down 5.4% compared with last year's rate of 68 million tpy, and 4.4% lower than the first-quarter 1985 rate.

Among major grades, printing and writing paper production was even with last year, although shipments were down. Packaging grades fell 9.7%, while kraft linerboard was off 4.8% (and 27.4% in production for export). Only tissue and uncoated free sheet showed gains, rising 2.3% and 2.4%, respectively. Corrugated box shipments declined 3.2% from last year, the Fibre Box Assn. reported.

Canadian newsprint shipments dropped a sharp 12.7% in May, the Canadian Pulp & Paper Assn. said, while operating rates stood at 95%, up from 91% in April. Canadian pulp production dropped 10.8%, with operating rates at 83%. ■

	Latest month (000 short tons)		% change from year ago	Annualized year-to-date (000 short tons)	% change from year ago
PAPER & PAPERBOARD PRODUCTION[1]					
Newsprint	May	461	−4.2	5,501	−1.8
Uncoated groundwood (s)	May	123	−8.2	1,485	−7.6
Coated paper (s)	May	494	−7.1	6,270	−.2
Uncoated free sheet (s)	May	810	4.8	9,643	2.4
Other printing/writing	May	112	−11.1	1,349	−9.6
Total packaging and other paper (s)	May	444	−11.6	5,265	−9.7
Tissue	May	440	6.8	4,985	2.3
Total paper	**May**	**2,884**	**−2.5**	**34,498**	**−1.5**
Unbleached kraft paperboard	May	1,419	−8.0	16,557	−4.6
Semichemical medium	May	431	−.9	5,015	−3.2
Bleached paperboard	May	328	−6.3	3,993	−2.9
Recycled paperboard	May	621	−10.4	7,479	−6.8
Total paperboard	**May**	**2,799**	**−7.3**	**33,044**	**−4.7**
Total U.S. paper and paperboard output	**May**	**5,684**	**−4.9**	**67,542**	**−3.1**
PULP, WASTEPAPER & FIBER[2]					
Total U.S. woodpulp production	Apr.	4,403	−6.8	54,651	−2.0
Market pulp production	Apr.	564	−4.9	7,020	2.6
Wastepaper consumption at paper/board mills	Apr.	1,246	−6.0	15,419	−3.2
Pulpwood consumption (cords)	Apr.	7,148	−2.7	87,579	−1.0
CONVERTED PRODUCTS STATISTICS[3]					
Corrugated box shipments (billion ft²)	May	22.345	−3.0	112.168[6]	−.4
Containerboard inventories at U.S. box plants and mills	May 1	2,987	−1.2		
INTERNATIONAL TRADE[4]					
U.S. paper imports (including products)	Apr.	940	18.4	11,245	14.1
Imports of Canadian newsprint	Apr.	713	27.3	8,254	14.5
U.S. paper exports (including products)	Apr.	351	1.4	4,002	−4.6
Exports of unbleached kraft linerboard	May	145	−22.5	1,590	−27.4
Exports of woodpulp	Apr.	328	31.7	3,749	4.2
Norscan pulp inventories[4]	May 31	1,466	−7.7		
Norscan pulp operating rates[4]	May	80%	81%	90%	87%
CANADIAN STATISTICS[5] *(reported in metric tons)*					
Total newsprint shipments	May	742	−12.7	3,753[6]	5.1
Operating rates	May	94%	99%	94%	88%
Inventories held by U.S. consumers	May 31	1,488	17.5		
Other paper/board shipments	May	249	−2.0	1,241	8.3
Woodpulp shipments (export only)	May	583	−3.6	2,794[6]	10.7
Operating rates	May	83%	98%	87%	79%

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fiber Box Assn., Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = shipments.

BLEACHED PAPERBOARD: Oversupply will weigh on market through 1986; pricing unstable

Grade structure: Primary uses for solid bleached sulfate (SBS) paperboard are for folding carton and milk carton stock. SBS is also used for cups, plates and trays, linerboard, and other packaging uses. Bleached boards come in calipers ranging from 10 to 28 pt, in low-, medium-, and high-density levels, available in basis weights 120 to 300 lb/3,000 ft². About half of the SBS produced is coated.

Production/capacity: Production of bleached board was up 3.1% in 1984 to 4.05 million tons, after having risen the year before by 7.1% to 3.93 million tons. As a result, operating rates increased from 95.1% in 1983 to 95.6% last year—nearly as high as the record 96% achieved in 1976. Exports pulled down the market some, falling by 7.1% to 478,000 tons.

By end use, 1984 production of milk carton stock rose 6.3% to 645,000 tons; folding carton stock was up 7.1% to 1.85 million tons; linerboard was up a slight 2.2% to 118,500 tons; plate, dish, and tray was relatively flat with a 0.4% hike to 291,000 tons. Heavyweight cup and rounded nested food containers and cup lids declined a slight 0.2% to 416,400 tons, but other packaging uses were down by a more significant 5.4% to 662,700 tons.

Operating rates were bolstered somewhat last year by only a 2% increase in capacity to 4.2 million tons. Production, however, began to fall in the second half of 1984 as demand slipped and mill order backlogs fell. The Christmas season was slower than expected, leaving considerable inventory on hand by year-end. In addition, exports were hurt by the strong U.S. dollar.

Outlook: SBS markets should be sloppy during the next year or two, with a 6% increase in overall capacity forecast between 1985 and 1987, yielding an extra 252,000 tons, according to the American Paper Institute. API notes, however, that some shutdowns of existing machines should somewhat offset this increase.

Not included in that forecast, though, is Federal Paper Board Co.'s conversion of a partly thermomechanical pulp-based machine at Continental Forest Industries Inc.'s former Augusta, Ga., mill to 100% solid bleached sulfate. The reconfiguration expanded bleached board capacity by about 65,850 tpy.

In addition, Westvaco Corp.'s new 175,000-tpy bleached board machine is slated to come online at the Covington, Va., mill in the first quarter of next year. The company plans eventually to raise its SBS capacity overall by 75% by 1994, but details are not yet firm.

API forecasts SBS capacity will increase by 134,000 tons this year and 118,000 tons over the next two years, reaching 4.439 million tons in 1987.

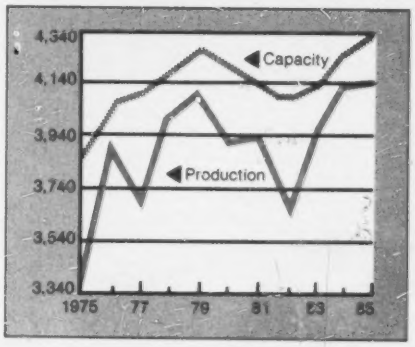
Production is expected to remain flat or decline slightly in 1985 but rise about 5% in 1986, lifting operating rates to about 96.5%. Demand for folding carton and cup and plate stock will rise slightly. Milk carton, though, began a downturn in 1985 that could mark another declining trend, with production off more than 5% during the early part of 1985.

SBS production was down 1.5% compared with the same five-month period in 1984, according to API.

Prices: Recovery in prices began at a rapid pace at the height of demand in the second quarter of 1984. As summer wore on, though, prices softened. Hikes posted earlier in the year began to erode. By year-end, discounting was becoming more widespread, and the range in transaction levels was widening with some spot market prices in the low $500 range. A small amount of tonnage, however, was still selling around $660.

SBS 15-pt coated folding carton board (rolls), $/short ton, year-end: 1973, $300; 1974, $360; 1975, $360/365; 1976, $385; 1977, $405; 1978, $425/445; 1979, $490; 1980, $550; 1981, $625; 1982, $590/625; 1983, $590/625; 1984, $590/665; 1985 (July), $550/665.

SUPPLY/DEMAND (000 tons)



FORECAST (000 tons)

	1983	1984	1985e
Production	3,926	4,048	4,000
Capacity[1]	4,129	4,187	4,321
Utilization rate	95.1%	96.7%	92.6%
Imports	—	—	—
Exports[2]	515	478	460
Apparent U.S. consumption	3,411	3,570	3,540
lb/capita	33.56	34.24	33.52
GNP ratio	2.56	2.47	2.37

1. Because of grade switching, capacity utilization is difficult to define.
2. API production for export.
e = Estimate.

TOP U.S. PRODUCERS (000 tpy)

	Annual capacity	Market share (%)
1. Federal Paper[1]	855	19.8
2. International Paper	810	18.7
3. Potlatch	535	12.4
4. Temple-Eastex	440	10.2
5. Westvaco	420	9.7
6. Champion Intl.	290	6.7
7. James River	219	5.1
8. Weyerhaeuser	200	4.6
9. Gulf States Paper	180	4.2
10. CCA	172	4.0

Market share of top five companies: **70.8%**

Market share of top ten companies: **95.4%**

Total U.S. capacity (1985): **4.321 million short tons**

1. Bought former Continental Forest Industries' Augusta, Ga., 430,000-tpy bleached board mill in March 1985 and increased the mill's capacity by over 65,000 tpy.

CRUDE TALL OIL: Tight supply of CTO disrupting TOFA price, supply

Production. In 1984, the output of crude tall oil (CTO) was only 2% above the 1983 level. Inventories decreased by 50% for some suppliers after attaining record levels in 1983. Many CTO producers have had periods where two-month backlogs were not uncommon. Meanwhile, the price has skyrocketed above $150/ton in all regions. The reasons are quite plain: unscheduled pulp mill downtime, an increasing amount of woodpulping that does not yield CTO and the somewhat passive attitude of pulp producers toward the CTO fractionating industry.

CTO is split into three intermediates that have had divergent market conditions over the past 18 months. Seven fractionators operate in the U.S., processing close to 820,000 short tpy. Tall oil fatty acids (TOFA)—products that contain at least 90% fatty acid—are broken into two classifications: less than 2% rosin and 2% to 10% rosin. The demand for both fractions is strong while supply weakens with decreased pulp production. TOFA is used as an intermediate chemical and as an additive in the production of protective coatings, in ore flotation, and in the production of soaps and detergents. Production of TOFA is at its highest level since 1972, when a record 428 million lb were manufactured. The two types were produced in relatively equal amounts. It should be noted that these records are being set while supply of CTO is short, and consequently, the fractionators have been operating between 75% and 90% of their design capacity. Exports are down 35% since the early 1970s, mostly attributed to declining markets in Europe, Mexico, and Canada, which are now importing from Scandinavian countries. Growth potential is still seen in Asia and South America, where imports have climbed 50% during the last ten years. Distilled tall oil (DTO), containing less than 90% fatty acid, and acid-refined oils are included in these markets, and demand has remained strong through mid-1985.

Tall oil rosin (TOR) has come full circle in this decade, and the worst may still be ahead. TOR stocks are currently at record levels, and the price is falling. Foreign competition involving Portugal, China, and Brazil is taking advantage of the U.S. export market and is looking to expand further into the U.S. domestic market. These countries produce rosin and turpentine by gum fractionation, which is said to be labor-intense. China has been producing rosin since the first century and has the necessary raw materials to become the primary world source if it adopts western methods (i.e., purchases the technology) of production. Brazil, the latest country to enter the rosin trade, is believed to be sending the world market into chaos by proposing rock-bottom prices and increased supply. Major uses for rosin in the U.S. are paper sizing (about a third); rubber and chemical manufacturing (another third); and coatings, ester gum, and synthetic rosin production.

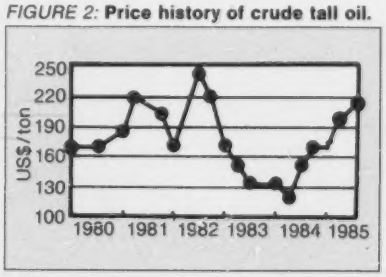
Prices. CTO has increased its dollar value as a result of the short supply. Over the last three quarters, prices have risen over $60/ton. The increased raw material costs for fractionators have forced higher prices on customers. In fact, for the last 18 months all suppliers of TOFA, DTO, and derivatives have added 2 to 9¢/lb to each product at least two times.

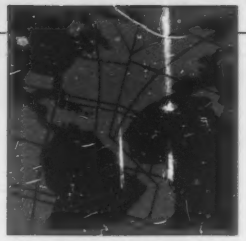
TOR price fluctuations usually concur with those of TOFA but not this year. High inventories, foreign products, and weak demand have leveled prices and forced some discounting. Producer profits have suffered as a result since decreased TOR production holds TOFA output down. The soybean crop, an influence on TOFA and TOR price, has not had any effect this year. Most sources believe new markets may have to be found to rescue TOR products and their prices.

FIGURE 1: **Production and distribution of crude tall oil fractions.**

1. CTO is given in thousands of short tons.
2. First number is total production; second number is production of less than 2% rosin content.

FIGURE 2: **Price history of crude tall oil.**





WORLD REVIEW

The U.S. led world pulp and paper producers to a record year in 1984

Total world paper and paperboard output was nearly 209 million tons; all 26 major producing nations increased their output during the year

By JOHN PEARSON, PETER SUTTON, HUGH O'BRIAN, International Editors

■ The world's paper and paperboard producers set a new record high in 1984. The widespread economic recovery, led by the U.S., pushed up demand so that mills in many of the major papermaking countries ran flat-out for much of the year. Successful price rises and order backlogs were commonplace in many of the world's pulp and paper markets. But during the last quarter, demand began to slacken, and 1985 is generally thought unlikely to bring another big output boost or the record profit levels enjoyed by many companies last year.

Total world paper and paperboard output in 1984 was nearly 209 million tons, 7% up from 1983 and 12.5% higher than 1982's production. Consumption also increased 7% to total 207 million tons.

Broken down into the main sectors, the world made approximately 2.2 million tons more newsprint, 4.4 million tons more of both printing/writing and packaging paper and paperboard, with production of other grades accounting for the rest of the rise. Pulp production increased 6%, reaching 154 million tons, 74% of paper and paperboard output. Of the pulp rise, over 60% was due to higher chemical woodpulp production and nearly 30% to the rise in output of mechanical pulps.

WORLDWIDE IMPROVEMENT. The new record highs set by the world's big producers were the main contributors to the overall increase. But the improvement in demand was, with a few exceptions, worldwide.

World's top 20 producing and consuming countries

PAPER AND BOARD PRODUCTION (000 tons)

	1984	% change 1984/83
1. U.S.	62,307	+5.6
2. Japan	19,345	+4.9
3. Canada	14,222	+6.5
4. U.S.S.R.	9,825	+2.8
5. Fed. Rep. Germany	9,157	+10.7
6. People's Rep. China	7,560	+14.3
7. Finland	7,318	+14.6
8. Sweden	6,869	+8.2
9. France	5,566	+5.8
10. Italy	4,714	+10.7
11. Brazil	3,765	+10.2
12. U.K.	3,507	+9.3
13. Spain	2,950	+7.1
14. Mexico	2,240	+8.6
15. Rep. of Korea	2,207	+11.4
16. Taiwan	1,929	+12.2
17. Austria	1,922	+7.4
18. Netherlands	1,885	+8.5
19. Norway	1,562	+14.2
20. Australia	1,559	+7.4

PULP PRODUCTION (000 tons)

	1984	% change 1984/83
1. U.S.	50,394	+5.7
2. Canada	20,173	+4.9
3. Sweden	9,240	+6.6
4. Japan	9,127	+3.0
5. U.S.S.R.	8,152	+3.0
6. Finland	8,031	+12.1
7. People's Rep. China	5,352	+13.3
8. Brazil	3,387	+9.3
9. Fed. Rep. Germany	2,222	+6.8
10. France	2,052	+9.7
11. Norway	1,864	+13.7
12. Spain	1,435	+1.6
13. Austria	1,229	+5.1
14. South Africa	1,165	—
15. New Zealand	1,158	+7.9
16. Portugal	1,155	+10.8
17. Czechoslovakia	1,052	+7.7
18. India	1,050	—
19. Poland	876	+0.8
20. Romania	845	—

PER CAPITA CONSUMPTION (lb/year)

	1984	% change 1984/83
1. U.S.	633	+7.5
2. Sweden	490	+4.7
3. Canada	441	+6.3
4. Denmark	406	+8.6
5. Finland	397	+7.1
6. Fed. Rep. Germany	388	+10.2
7. Switzerland	384	+6.2
8. Netherlands	377	+8.2
9. Japan	373	+10.5
10. Belgium	355	+5.9
11. Norway	322	+12.3
12. Australia	313	+11.8
13. U.K.	295	+6.1
14. New Zealand	291	−10.2
15. Hong Kong	287	+8.9
16. France	278	+4.5
17. Singapore	273	+29.2
18. Austria	265	+10.1
19. Taiwan	229	+13.3
20. Iceland	207	−8.3

REVIEW OF TOP 27 NATIONS IN PULP/PAPER PRODUCTION

Abridged data on production and export/import trade are given for countries included in the Top 20 tables for paper and board production and for pulp production

Australia

Population: 15,543,000. Per capita consumption of paper and board: 142 kg/313 lb. Paper and board mills: 16. Pulp mills: 18 (sulfate: 2; sulfite: 1; soda: 2; semichemical: 4; mechanical: 8; nonwood: 1).

Paper/board capacity: 1,669,000 tons **Pulp capacity:** 1,155,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Newsprint and other paper	589	589	364	n.a.	n.a.	n.a.
Other paper and board	882	961	228	n.a.	n.a.	n.a.
Total	**1,451**	**1,559**	**574**	**722**	**55**	**74**
Total pulp	**618**	**718**	**218**	**270**	**6**	**6**

Austria

Population: 7,551,700. Per capita consumption of paper and board: 120 kg/264 lb. Paper and board mills: 34. Pulp mills: 16 (sulfate: 2; sulfite: 8; semichemical: 1; mechanical: 6).

Paper/board capacity: 2,198,000 tons **Pulp capacity:** 1,433,000 tons
Operating rate 1984: 87% **Operating rate 1984:** 86%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	1,014	1,062	158	203	720	763
Board	775	840	91	99	847	523
Total	**1,785**	**1,922**	**249**	**302**	**1,207**	**1,286**
Chemical woodpulp	850	923	220	222	224	242
Other pulps	319	306	17	19	12	5
Total	**1,169**	**1,229**	**237**	**241**	**236**	**247**

Brazil

Population: 134,000,000. Per capita consumption of paper and board: 25 kg/55 lb. Paper and board mills: 164. Pulp mills: 48.

Paper/board capacity: 4,140,000 tons **Pulp capacity:** 3,990,000 tons
Operating rate 1983: 85% **Operating rate 1983:** 74%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	2,041	2,235	252	180	266	371
Board	1,377	1,530	—	—	139	288
Total	**3,418**	**3,765**	**252**	**180**	**405**	**659**
Chemical woodpulp	3,098	3,387	6	14	1,022	960
Other pulps						
Total	**3,098**	**3,387**	**6**	**14**	**1,022**	**960**

Canada

Population: 25,100,000. Per capita consumption of paper and board: 200 kg/441 lb.. Paper and board mills: 107. Pulp mills: 34.*

Paper/board capacity: 15,552,000 tons **Pulp capacity:** 23,846,000 tons
Operating rate 1984: 89% **Operating rate 1984:** 90%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	11,065	11,787	286	369	8,603	9,210
Board	2,286	2,435	167	197	520	549
Total	**13,351**	**14,222**	**453**	**566**	**9,123**	**9,759**
Chemical woodpulp	11,210	11,422	97	136	6,352	6,114
Other pulps	8,021	8,751	56	58	443	589
Total	**19,231**	**20,173**	**153**	**194**	**6,795**	**6,703**

*Market pulp only.

China, People's Rep. of

Population: 1,036,040,000. Per capita consumption of paper and board: 7.5 kg (e) / 17 lb. Paper and board mills: 1,600e. Pulp mills: n.a..

Paper/board capacity: 7,810,000 tons **Pulp capacity:** 6,650,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	3,570	4,051	—	—	163	147
Packaging paper/board	3,043	3,509	—	—	103	85
Total	**6,613**	**7,560**	**—**	**—**	**266**	**232**
Chemical woodpulp	775	832	—	—	—	—
Mechanical pulp	342	373	—	—	—	—
Reed, bamboo and other pulps	3,608	4,147	—	—	—	—
Total	**4,725**	**5,352**	**—**	**—**	**—**	**—**

Czechoslovakia

Population: 15,481,000. Per capita consumption of paper and board: 77 kg/170 lb. Paper and board mills: 49. Pulp mills: 22 (sulfate: 5; sulfite: 5; semichemical: 1; mechanical: 10; nonwood: 1).

Paper/board capacity: 1,370,000 tons **Pulp capacity:** 1,223,000 tons
Operating rate 1984: 92% **Operating rate 1984:** 86%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	722	715	41	55	98	114
Board	536	548	67	65	86	78
Total	**1,258**	**1,263**	**108**	**110**	**184**	**192**
Chemical woodpulp	771	859	61	50	92	149
Other pulps	206	193	41	43	3	3
Total	**977**	**1,052**	**102**	**93**	**95**	**152**

Finland

Population: 4,884,000. Per capita consumption of paper and board: 180 kg/397 lb. Paper and board mills: 46. Pulp mills: 50 (sulfate: 18; sulfite: 7; semichemical: 3; mechanical: 22).

Paper/board capacity: 8,140,000 tons **Pulp capacity:** 9,050,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	4,825	5,707	22	27	4,042	4,735
Board	1,563	1,611	29	34	1,215	1,243
Total	**6,388**	**7,318**	**51**	**61**	**5,257**	**5,978**
Chemical woodpulp	4,379	4,770	13	23	1,315	1,309
Other pulps	2,784	3,261	19	26	257	252
Total	**7,163**	**8,031**	**32**	**49**	**1,572**	**1,561**

France

Population: 540,000,000. Per capita consumption of paper and board: 126 kg/278 lb. Paper and board mills: 162. Pulp mills: 25 (sulfate: 7; sulfite: 3; semichemical: 6; mechanical: 9).

Paper/board capacity: 5,500,000 tons **Pulp capacity:** 2,250,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	2,716	2,915	1,248	1,293	729	811
Board	2,547	2,650	1,192	1,269	457	508
Total	**5,263**	**5,565**	**2,440**	**2,562**	**1,186**	**1,319**
Chemical woodpulp	1,457	1,575	1,515	1,517	219	248
Other pulps	413	477	107	106	—	—
Total	**1,870**	**2,052**	**1,622**	**1,625**	**219**	**248**

Total production for all the main regions increased, even if only marginally, and all of the 26 nations that produce over 1.1 million tpy of paper and paperboard increased their output in 1984.

But the most significant indicator of a healthy year was the rise in the output of the U.S., the world's biggest producer (33% of all paper and paperboard) and consumer (36%). Its output was 68.7 million tons, a record high, up 5.6% from 1983. Production records were also set by Japan, the U.S.S.R., People's Rep. of China, Fed. Rep. Germany, Sweden, and Finland, among others.

GOOD START, WEAK END. The major rise in paper and paperboard demand—and consequently pulp consumption—was largely caused by the U.S.-led worldwide economic recovery. With business already improving in 1983, the long shutdown of mills in western Canada tightened up pulp markets, leading to price increases, which were later passed on as paper price rises.

Paper and paperboard price increases went through in many markets during 1984, the result of a rise in demand that, in many sectors, could not be met by mills. In particular, the growing strength of the dollar and strong demand made the U.S. a most attractive market for importers, mainly for printing/writing grades. European, South American, and other producers were quick to take advantage.

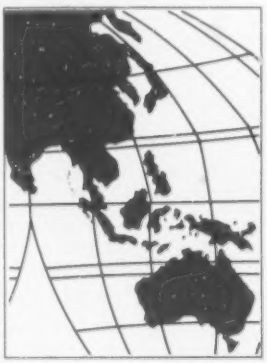
But by late 1984 signs of weakness appeared in several sectors. For example, the dollar's strength plus the effect of planned new capacity was beginning to weaken market pulp prices and North American suppliers. European newsprint price rises, while going through, were being discounted and the big U.S. uncoated woodfree paper market suffered as imports undermined prices.

Into early 1985, kraft liner and market pulp prices were suffering and the high dollar rate resulted in the growth of local currency selling in Europe to the further advantage of Nordic suppliers. The planned U.S. newsprint price rise was set back again and again. And some Far Eastern markets became virtual dumping grounds for pulp and some paper grades.

But several major markets, particularly printing/writing, remained buoyant through to mid-1985, though in most cases not as strong as a year earlier.

NEW PROJECTS AFTER A GOOD YEAR. Following naturally after a good year came a spate of announcements of new capital investment, mainly in new paper capacity, during 1984. The startup of four new pulp mills over 1984 and 1985 in Europe and North America, adding 1.1 million tpy of capacity, meant a reduction in new investment in this sector. New paper capacity led to concern about overcapacity, particularly among EEC producers, who worried that new Nordic output would further weaken markets.

Many of the reports filed by the network of national editors and correspondents for this year's world review reflected uncertainty over the prospects for this year. In general, 1985 appears unlikely to result in much—if any—growth compared with the bumper year of 1984. ■



ASIA/ AUSTRAL-ASIA

TOTAL PAPER AND BOARD output in Asia was nearly 38.5 million short tons in 1984, up 8% from 1983. All of the big four producing nations increased their output, but it was the continuing strength of the largest, Japan, which really caused the rise. In another record year, Japan's output totaled 21.3 million tons, up 4.9%.

People's Rep. of China recorded an increase of almost 1.1 million tons to give a 1984 total of 8.3 million tons, while Rep. of Korea's production moved over the 2-million-ton mark, up 11%, and Taiwan's was 2.1 million tons, up 12%. Indian output remained close to 1983's level, at 1.5 million tons.

Most country reports commented on the benefits of the U.S.-led business recovery in 1984 and on the uncertain prospects for this year. It is generally expected that the paper and board industry will run at or slightly below 1984's level, helped by the decline in international market pulp prices.

The increasing importance of secondary fiber was again emphasized by increasing wastepaper imports by Japan, Rep. of Korea, and Taiwan. Asian pulp output was

Production by continents, world total (000 metric tons)

PULP

	1960	1970	1980	1983	1984
North America	32,964	54,912	65,969	66,893	70,567
Europe	20,965	34,853	40,235	39,281	41,978
Asia/Australasia	5,156	14,268	18,239	18,441	19,624
Latin America	821	2,224	5,848	5,871	6,322
Africa	124	900	1,502	1,654	1,677
World total	**60,031**	**107,157**	**131,793**	**132,140**	**140,168**

PAPER AND PAPERBOARD

	1960	1970	1980	1983	1984
North America	38,917	58,914	70,225	72,334	76,529
Europe	25,634	45,159	59,023	60,518	65,283
Asia/Australasia	7,861	20,621	31,962	34,602	37,314
Latin America	1,656	3,712	7,737	8,023	8,702
Africa	288	892	1,717	1,805	2,083
World total	**74,355**	**129,298**	**170,664**	**177,282**	**189,911**

TOP 27 PRODUCING NATIONS *(Continued)*

Germany, Fed. Rep.

Population: 61,161,000. Per capita consumption of paper and board: 176 kg/ 389 lb. Paper and board mills: 194. Pulp mills: 37 (sulfite: 10; semichemical: 1; mechanical: 26).

Paper/board capacity: 9,865,000 tons **Pulp capacity:** 2,258,000 tons
Operating rate 1984: 93% **Operating rate 1984:** 98%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	5,492	6,062	2,718	3,069	1,605	1,886
Board	2,780	3,095	1,221	1,340	784	917
Total	**8,272**	**9,157**	**3,939**	**4,429**	**2,389**	**2,802**
Chemical woodpulp	654	660	2,569	2,579	66	81
Other pulps	1,427	1,562	207	213	28	54
Total	**2,081**	**2,222**	**2,776**	**2,792**	**114**	**135**

India

Population: 683,000,000. Per capita consumption of paper and board: 2.2 kg/ 4.8 lb. Paper and board mills: 222. Pulp mills: n.a.

Paper/board capacity: 2,165,000 tons **Pulp capacity:** 1,450,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Total paper and board	**1,337**	**1,367**	**130**	**135**	**—**	**—**
Total pulp	**1,050**	**1,050**	**—**	**—**	**—**	**—**

Italy

Population: 56,970,000. Per capita consumption of paper and board: 93 kg/ 205 lb. Paper and board mills: 397. Pulp mills: 28 (sulfite: 2; semichemical: 5; mechanical: 16; nonwood: 5).

Paper/board capacity: 5,300,000 tons **Pulp capacity:** 1,000,000 tons
Operating rate 1984: 89% **Operating rate 1984:** 81%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	2,468	2,838	835	963	620	835
Board	1,791	1,876	539	639	158	193
Total	**4,259**	**4,714**	**1,373**	**1,602**	**778**	**1,028**
Chemical woodpulp	213	223	1,300	1,511	40	57
Other pulps	574	599	102	122	1	6
Total	**787**	**822**	**1,402**	**1,633**	**41**	**63**

Japan

Population: 120,235,000. Per capita consumption of paper and board: 169 kg/ 350 lb. Paper and board mills: 593. Pulp mills: 65 (sulfate: 37; sulfite: 5; semichemical: 7; mechanical: 22; nonwood: 3).

Paper/board capacity: 23,495,000 tons **Pulp capacity:** 12,519,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	10,932	11,429	402	454	365	379
Board	7,510	7,915	280	242	373	464
Total	**18,442**	**19,345**	**685**	**696**	**738**	**843**
Chemical woodpulp	6,738	7,062	1,515	1,509	43	30
Other pulps	2,122	2,064	657	655	2	9
Total	**8,860**	**9,127**	**2,172**	**2,164**	**46**	**39**

Korea, Rep. of

Population: 40,577,000. Per capita consumption of paper and board: 54 kg/ 119 lb. Paper and board mills: 170e. Pulp mills: 5 (sulfate: 1; mechanical: 4).

Paper/board capacity: 2,232,000 tons **Pulp capacity:** 307,000 tons
Operating rate 1984: 99% **Operating rate 1984:** 84%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	1,035	1,119	36	40	52	39
Board	947	1,088	16	22	46	36
Total	**1,982**	**2,207**	**52**	**62**	**98**	**75**
Chemical woodpulp	116	121	453	519	—	—
Other pulps	126	137	59	72	—	—
Total	**242**	**258**	**512**	**591**	**—**	**—**

Mexico

Population: 77,500,000. Per capita consumption of paper and board: 29.5 kg/ 65 lb. Paper and board mills: 65. Pulp mills: 20 (sulfate: 10; sulfite: 1; nonwood: 9).

Paper/board capacity: 3,098,000 tons **Pulp capacity:** 1,068,000 tons
Operating rate 1984: 72% **Operating rate 1984:** 75%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	1,167	1,284	87	48	26	48
Board	895	956	59	25	4	—
Total	**2,062**	**2,240**	**146**	**73**	**30**	**48**
Chemical woodpulp	414	438	154	196	—	—
Other pulps	345	363	9	14	—	—
Total	**759**	**801**	**163**	**212**	**—**	**—**

Netherlands

Population: 14,420,000. Per capita consumption of paper and board: 171 kg/ 377 lb. Paper and board mills: 33. Pulp mills: 3 (mechanical: 2; nonwood: 1).

Paper/board capacity: 1,992,000 tons **Pulp capacity:** 158,000 tons
Operating rate 1984: 96% **Operating rate 1984:** 98%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	880	968	1,010	1,129	629	698
Board	857	927	504	550	466	500
Total	**1,737**	**1,895**	**1,514**	**1,679**	**995**	**1,198**
Chemical woodpulp	—	—	521	536	3	6
Other pulps	—	—	26	35	1	1
Total	**147**	**156e**	**548**	**570**	**4**	**7**

New Zealand

Population: 3,230,000. Per capita consumption of paper and board: 132 kg/ 291 lb. Paper and board mills: 6. Pulp mills: 9 (sulfate: 2; semichemical: 2; mechanical: 5).

Paper/board capacity: 818,134 tons **Pulp capacity:** 1,475,375 tons
Operating rate 1984: 93% **Operating rate 1984:** 79%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	410	523	37	28	228	269
Board	259	238	—	—	59	50
Total	**669**	**762**	**37**	**28**	**287**	**319**
Chemical woodpulp	604	592	7	9	219	229
Other pulps	469	585	1	2	251	257
Total	**1,073**	**1,183**	**8**	**11**	**470**	**486**

up only 1.1 million tons from 1983, totaling 19.6 million tons. Imports stayed about the same at 3.85 million.

Including the small export market, these gave an apparent pulp consumption of 23 million tons (wood and nonwood), giving a share of about 60% of paper and board produced. Wastepaper in Japan now provides about half of the raw fiber for papermaking, and this is expected to increase, mostly by raising import levels.

But it was imports of paper and board which stirred strong reaction from some major foreign suppliers, particularly the U.S., where there were claims of trade barriers. The Japanese government is reportedly planning to open up the domestic market further.

It is the big four that are also carrying out most of the capital investment, though others, such as Indonesia (which hopes to become self-sufficient in newsprint in the next few years), Turkey, and Pakistan, are planning or completing significant new projects. Even Nepal is beginning to start its own industry.

There are more and more signs that People's Rep. of China is carrying out a major modernization of its pulp and paper industry, ordering both new and secondhand machinery from abroad. Both Taiwan and Rep. of Korea are completing big expansion phases. Eight projects were finished last year in Taiwan, and nine new paper machines are to start this year in Rep. of Korea, most of which will add new production capacity.

Despite agreed limitations to new capacity, many Japanese mills are carrying out modernization programs, largely replacing aging production lines. Many paper producers are also moving strongly into coated grades.

In India, two new newsprint mills started up last year and several definite projects are going ahead. But India also reflects some of the continuing difficulties faced by many pulp and paper mills in Asia: increasing energy prices and uncertain power supply, higher raw material costs, and labor unrest. Other widespread problems include difficulties in obtaining foreign exchange to buy materials, rising inflation, and interest rates.

Pulp and paper producers in both Australia and New Zealand enjoyed strong recovery in 1984. In Australia, higher demand was reflected by a per capita consumption increase from 280 lb/head in 1983 to 130 lb. Total Australasian paper and board output was up 9.5% at 2.55 million tons, while pulp production climbed nearly 11% to 2.06 million tons.

LATIN AMERICA

THE CONTINENT'S ECONOMIC problems did not lessen during 1984, with many of the countries struggling to keep inflation below 50% and some with inflation running into four figures. The rescheduling of international debts continued to be an international cause for concern. These problems, added to political instability in some major countries, meant that investment capital was somewhat restricted and had to be generated from profits of individual firms.

The strength of the U.S. dollar and continuing high interest rates had a double-edged effect: while they increased the debt burden of Latin American countries they also allowed the countries to enter export markets effectively as low-cost producers. Nowhere was this more true than in the market pulp and linerboard sectors, where producers—especially in Brazil—were able to effectively undercut Nordic and North American suppliers to the European market. The EEC linerboard market was particularly attractive because its minimum pricing policies, which were binding for U.S. and Nordic suppliers, did not extend to Latin American producers.

Total Latin American paper and board output rose by 8.4% during the year, reaching 9.6 million short tons. Brazil was by far the biggest producer, with an output of 4.2 million tons, followed by Mexico with 2.4 million tons. Paper and board exports soared to 995,380 tons—an increase of over 50% compared with 1983. Again Brazil was mainly responsible for the rise, accounting for 726,416 tons of the total.

Pulp production was up 7.7%, to 6.9 million tons, with Brazilian production rising by 9.3%, to 3.7 million tons, and Chile's output increasing 5.4%, to 924,830 tons. But exports from the continent fell by 3%, to 1.65 million tons, reflecting increasing demand from new papermakers inside Latin America.

Several of the projects scheduled to start up during the year were postponed due to lack of funding or government problems. But in Brazil, the 151,000-tpy Pisa newsprint mill started up in December, and in Mexico, Kimberly-Clark de Mexico SA started its 49,600-tpy, 5.3-m-trim tissue machine. Several of the new projects originally scheduled for 1984 startup are now expected to be commissioned in 1985 or early 1986. These include the El Rancho pulp mill in Guatemala, and Papeles Sud America's 110,200-tpy packaging paper mill in Chile. Compania Suzano and Champion Papel e Celulose SA have started new printing/writing paper machines adding 165,345 tpy to Brazil's capacity in these grades.

In Argentina, Celulosa Puerto Piray is due to start up its 154,300-tpy kraft paper and corrugating medium mill next year. Other projects will probably be seriously delayed by the country's severe economic problems.

Pulp producers in Chile are all planning capacity increases. While some of these amount to removing production bottlenecks, other major studies are underway that, in at least one case, will explore doubling capacity.

Brazilian producers are also planning major pulp capacity increases for the late 1980s and 1990s. These include a doubling of capacity at Aracruz Celulose SA and Cenibra, and new pulpwood plantations at Riocell.

Despite the continent's economic problems, it seems likely these projects—with funding partly based on existing successful operations, partly on state and private investment—stand a good chance of coming to fruition.

WORLD PULP, PAPER, AND BOARD

	Population (1,000)	Number of mills P&B	Number of mills Pulp	CAPACITY (1,000 m tons) P&B	CAPACITY (1,000 m tons) Pulp	Per capita (lb)	CONSUMPTION (1,000 tons) P&B 1983	CONSUMPTION (1,000 tons) P&B 1984	CONSUMPTION (1,000 tons) Pulp 1983	CONSUMPTION (1,000 tons) Pulp 1984	PRODUCTION (1,000 m tons) P&B 1983	PRODUCTION (1,000 m tons) P&B 1984	PRODUCTION (1,000 m tons) Pulp 1983	PRODUCTION (1,000 m tons) Pulp 1984
EUROPE														
Belgium	10,000	15	3	919	345	355.0	1,499	1,609	620	615	837	858	326	335
Denmark	5,116	6	3	375	135	406.0	867	942	178	180	319	352	111	127
France	54,000	162	25	5,500	2,250	278.0	6,517	6,809	3,273	3,429	5,263	5,566	1,870	2,052
Germany, Fed. Rep.	61,181	194	37	9,865	2,258	388.7	9,822	10,784	4,743	4,879	8,272	9,157	2,081	2,222
Greece	9,700	19	4	415	65	113.0	458	497	195	185	273	300	45	45
Ireland	3,200	2	0	50	0	186.0	270	270	20	20	20	20	0	0
Italy	56,970	397	28	5,300	1,000	204.7	4,854	5,288	2,148	2,392	4,259	4,714	787	822
Netherlands	14,420	33	3	1,992	156	377.1	2,256	2,488	692	719	1,737	1,885	147	156e
United Kingdom	55,950	95	3	3,796	196	295.7	7,070	7,502	1,655	1,820	3,209	3,507	173	190
EEC	**270,537**	**923**	**166**	**28,182**	**6,407**	**294.8**	**33,613**	**38,169**	**13,524**	**14,240**	**24,189**	**26,359**	**5,540**	**5,949**
Finland	4,884	46	50	8,140	9,050	396.9	1,182	1,401	5,623	6,519	6,388	7,318	7,163	8,031
Norway	4,114	23	27	1,815	2,195	321.9	527	561	1,243	1,411	1,388	1,562	1,640	1,864
Sweden	8,330	56	56	7,670	9,957	489.5	1,858	1,899	5,699	6,206	6,350	6,989	8,668	9,240
Scandinavia	**17,328**	**125**	**133**	**17,626**	**21,202**	**423.6**	**3,567**	**3,861**	**12,565**	**14,136**	**14,106**	**15,749**	**17,471**	**19,135**
Austria	7,552	34	16	2,194	1,433	264.6	831	938	1,170	1,223	1,789	1,922	1,169	1,229
Iceland	235	0	0	0	0	206.4	24	22	0	0	0	0	0	0
Malta	350	0	0	0	0	189.0	30	30	0	0	0	0	0	0
Portugal	9,905	95	8	720	1,105	109.7	471	453	423	532	585	653	1,042	1,155
Spain	38,000	156	29	3,290	1,635	173.2	2,779	2,985	1,383	1,429	2,754	2,950	1,412	1,435
Switzerland	6,482	29	6	1,090	325	383.0	1,053	1,126	540	545	918	986	284	302
Other W. Europe	**62,524**	**344**	**59**	**7,298**	**4,498**	**197.3**	**5,188**	**5,594**	**3,516**	**3,729**	**6,086**	**6,511**	**3,907**	**4,121**
Total W. Europe	**350,389**	**1,392**	**298**	**53,085**	**32,107**	**283.8**	**42,368**	**45,624**	**29,605**	**32,105**	**44,351**	**48,619**	**26,918**	**29,205**
Albania	2,750	4	4	15	15	15.2	19	19	10	10	10	10	10	10
Bulgaria	8,950	20	--	540	280	115.8	496	470	352	385	350	385	203	220
Czechoslovakia	15,481	49	22	1,370	1,223	169.8	1,182	1,181	984	993	1,258	1,263	977	1,052
German Dem. Rep.	16,701	21	19	1,500e	750e	179.2	1,352	1,357	796	815	1,244	1,296	674	687
Hungary	10,600	10	6	550e	190e	139.4	640	670	311	301	478	500	103	108
Poland	37,000	50	20	1,365	1,030	75.6	1,240	1,268	986	1,042	1,221	1,238	871	878
Romania	22,000	20	12	900	970	70.7	705	705	945	0	810	810e	845	845e
USSR	274,000	84	57	10,500e	9,500e	75.0	9,227	9,449	7,238	7,452	9,558	9,825	7,913	8,152
Yugoslavia	23,052	30	21	1,500	825	112.5	1,169	1,175	884	948	1,229	1,331	767	841
E. Europe	**410,534**	**288**	**161**	**18,240**	**14,743**	**87.5**	**16,009**	**16,294**	**12,516**	**12,871**	**16,167**	**16,884**	**12,363**	**12,773**
Total Europe	**760,923**	**1,680**	**459**	**71,305**	**46,850**	**177.9**	**58,377**	**61,918**	**42,121**	**44,976**	**60,518**	**65,503**	**39,281**	**41,978**
NORTH AMERICA														
Canada	25,100	107	34	15,552	23,846	441.6	4,681	5,029	12,589	13,664	13,351	14,222	19,231	20,173
United States	235,000	581	195	65,996	51,837	632.6	63,348	68,636	48,069	51,207	58,983	62,307	47,662	50,394
North America	**260,100**	**688**	**229**	**81,558**	**75,683**	**614.4**	**68,029**	**73,665**	**60,658**	**64,871**	**72,334**	**76,529**	**66,893**	**70,567**
ASIA														
Afghanistan	16,000	0	0	0	0	0.1	1	1e	0	0	0	0	0	0
Bangladesh	92,000	7	8	170e	150e	2.0	85e	85e	90e	90e	90e	90e	80e	80e
Bahrain	400	0	0	0	0	16.5	3	3e	0	0	0	0	0	0
Bhutan	1,400	0	0	0	0	1.6	1	1e	0	0	0	0	0	0
Brunei	300	0	0	0	0	14.7	2	2e	0	0	0	0	0	0
Burma	34,000	4	2	--	--	2.6	40e	40e	15e	15e	10e	10e	15e	15e
China, People's Rep.	1,036,040	1,600e	-	7,810	6,650	17.6	6,347	7,328	4,725	5,352	6,813	7,580	4,725	5,352
Cyprus	650	0	0	--	0	169.6	45	50e	0	0	0	0	0	0
Hong Kong	5,200	3	0	40e	0	286.2	665e	675e	5e	5e	35e	35e	0	0
India	683,000	222	-	2,166	1,450	4.8	1,517	1,502	1,050e	1,050e	1,337	1,367	1,050e	1,050e
Indonesia	150,000	35	16	877	300e	9.5	626	649e	386	345e	377	405e	167	200e
Iran	40,000	17	2	320e	250e	13.8	300e	250e	80e	60e	100e	75e	50e	40e
Iraq	13,000	2	2	144	90	11.9	70e	70e	40e	40e	30e	30e	30e	30e
Israel	4,400	5	0	155	0	179.4	343	358	68	69	139	152	0	0
Japan	120,235	593	65	23,495	12,519	372.6	18,389	19,200	10,986	11,252	18,442	19,345	8,860	9,127
Jordan	3,000	1	0	8	0	44.1	45	53	0	0	4	7	0	0
Kampuchea	9,000	0	0	0	0	1.2	5	5e	0	0	0	0	0	0
Korea, People's Rep.	20,000	6	2	100e	60e	9.9	90e	90e	50e	50e	80e	80e	50e	50e
Korea, Rep. of	40,577	170e	5	2,232	307	119.2	1,935	2,193	754	849	1,962	2,207	242	258
Kuwait	1,400	1	0	25	0	141.8	85e	90e	5e	10e	15e	20e	0	0
Laos	4,000	0	0	0	0	1.1	2	2e	0	0	0	0	0	0
Lebanon	3,300	3	0	20e	0	43.4	85e	65e	5e	5e	5e	5e	0	0
Macao	300	0	0	0	0	73.5	10	10e	0	0	0	0	0	0
Malaysia	11,427	13	-	100e	60e	70.6	362e	374e	45e	52e	65e	70e	40e	45e
Mongolia	1,750	1	1	10e	0	25.2	20e	20e	5e	5e	5e	5e	5e	5e
Nepal	16,400	1	-	3	-	1.6	10e	12e	0	0	0	2	0	0
Oman	1,000	0	0	0	0	11.0	5	5e	0	0	0	0	0	0
Pakistan	87,524	20e	19e	145e	115	4.4	259	260e	126	133e	133	136e	110	115e
Philippines	55,000	23	9	905	303	16.6	449	415	214	193	287	266	155	147
Qatar	300	0	0	0	0	14.7	2	2e	0	0	0	0	0	0
Saudi Arabia	9,500	0	0	0	0	23.2	100	100e	0	0	0	0	0	0
Singapore	2,500	2	0	20e	0	273.4	310e	310e	5e	5e	10e	10e	0	0
Sri Lanka	15,000	2	2	40	25	10.3	70e	70e	25e	25e	25e	25e	21e	21e
Syria	9,000	3	0	35e	0	20.6	84e	84e	10e	10e	10e	10e	0	0
Taiwan	19,013	148	31	2,300	600e	229.7	1,704	1,981	686e	713e	1,720	1,929	550e	575e
Thailand	50,000	33	5	450	110	23.9	515	542e	180	170e	398	380e	40	50
Turkey	48,000	36	17	637e	547e	33.8	580	736e	685e	650e	570	742e	545e	570e
United Arab Emirates	1,000	0	0	0	0	13.2	6	6	0	0	0	0	0	0
Vietnam	60,000	30e	30e	120	90	2.2	90e	60e	45e	50e	40e	50e	15e	20e
Yemen Arab Rep.	5,500	0	0	0	0	0.8	2	2e	0	0	0	0	0	0
Yemen Dem. Rep.	2,000	0	0	0	0	2.2	2	2e	0	0	0	0	0	0
Asia	**2,673,116**	**2,982**	**187**	**41,825**	**23,698**	**31.1**	**35,221**	**37,703**	**20,208**	**21,291**	**32,482**	**34,993**	**16,750**	**17,750**

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INDUSTRY AT A GLANCE

	Population (1,000)	Number of mills P&B	Number of mills Pulp	CAPACITY (1,000 m tons) P&B	CAPACITY (1,000 m tons) Pulp	Per capita (lb)	CONSUMPTION (1,000 tons) P&B 1983	CONSUMPTION (1,000 tons) P&B 1984	CONSUMPTION (1,000 tons) Pulp 1983	CONSUMPTION (1,000 tons) Pulp 1984	PRODUCTION (1,000 m tons) P&B 1983	PRODUCTION (1,000 m tons) P&B 1984	PRODUCTION (1,000 m tons) Pulp 1983	PRODUCTION (1,000 m tons) Pulp 1984
AUSTRALASIA														
Australia	15,543	16	15	1,589	1,192	313.1	1,970	2,207	808	980	1,491	1,589	618	716
Fiji	700	0	0	0	0	31.5	10	10e	0	0	0	0	0	0
New Zealand	3,230	6	9	818	1,475	291.1	419	471	611	683	669	782	1,073	1,158
Papua New Guinea	3,300	0	0	0	0	4.0	6	6e	0	0	0	0	0	0
Samoa	200	0	0	0	0	11.0	1	1e	0	0	0	0	0	0
Australasia	**22,973**	**22**	**27**	**2,407**	**2,630**	**254.4**	**2,408**	**2,695**	**1,439**	**1,663**	**2,120**	**2,321**	**1,691**	**1,874**
LATIN AMERICA														
Argentina	30,000	86	20	1,200	815	70.6	946	960	660	647	887	943	619	664
Bahamas	226	0	0	0	0	97.6	10	10	0	0	0	0	0	0
Barbados	280	0	0	0	0	55.1	7	7	0	0	0	0	0	0
Belize	150	0	0	0	0	14.7	2	1	0	0	0	0	0	0
Bolivia	5,600	9	5	62e	32e	30.0	90	90e	40	40e	59	59e	26	26e
Brazil	134,000	164	48	4,140	3,990	54.1	3,265	3,286	2,082	2,441	3,418	3,765	3,686	3,387
Chile	12,000	18	7	450	900e	49.4	268	269e	274	346e	324	339e	756	839
Colombia	28,000	26	8	530	250	35.5	461	461e	235	235e	365	365e	189	189
Costa Rica	2,600	2	1	18	25	11.9	13	14	10	12	13	14	10	12
Cuba	10,000	9	3	150e	60e	51.2	232	232e	80	80e	75	73e	3r	3fe
Dominican Rep.	5,551	2	0	46	0	25.8	66	66e	4	4e	9	9e	0	0
Ecuador	8,500	6	2	62e	14e	20.4	94	94e	28	28e	44	44e	4	4e
El Salvador	5,500	3	0	50	0	10.4	38	38	0	0	28	29	0	0
Guatemala	7,500	4	1	50	200	24.7	85	84e	10	0	40	34	0	0
Guyana	900	0	0	0	0	17.2	7	7e	0	0	0	0	0	0
Haiti	5,800	0	0	0	0	2.3	6	6e	0	0	0	0	0	0
Honduras	4,000	0	0	0	0	38.6	66	70	0	0	0	0	0	0
Jamaica	2,228	1	0	5	0	14.9	16	15	0	0	3	4	0	0
Mexico	77,500	66	20	3,096	1,066	44.2	2,179	2,265	922	1,013	2,042	2,240	758	861
Neth. Antilles	247	0	0	0	0	26.8	3	3e	0	0	0	0	0	0
Nicaragua	2,000	0	0	0	0	22.1	20	20	0	0	0	0	0	0
Panama	2,100	3	0	26	0	64.0	60	60	0	0	23	25	0	0
Paraguay	3,117	3	–	25e	25e	10.4	28	28e	15	15e	13	13e	15	15e
Peru	19,000	15	4	427	311	21.2	175	183e	90	90e	130	136e	58	58e
Surinam	355	0	0	0	0	93.2	15	15e	0	0	0	0	0	0
Trinidad/Tobago	1,149	0	0	0	0	23.0	10	12	0	0	0	0	0	0
Uruguay	2,900	12	3	60	30	44.1	47	56	33	37	47	54	28	30
Venezuela	18,800	14	3	783	180	100.0	700	783	473	619	467	557	236	264
Latin America	**388,061**	**442**	**133**	**11,138**	**7,860**	**51.8**	**8,939**	**9,121**	**4,952**	**5,699**	**8,003**	**8,700**	**5,871**	**6,303**
AFRICA														
Algeria	20,000	6	3	36	25	18.3	166	166e	90	90e	66	66e	30	30e
Angola	7,200	2	1	30	45	8.6	28	28e	25	25e	18	19e	35	35e
Benin	3,700	0	0	0	0	1.6	3e	3e	0	0	0	0	0	0
Botswana	900	0	0	0	0	2.5	1e	1e	0	0	0	0	0	0
Burkina Faso	7,000	0	0	0	0	0.2	1	1	0	0	0	0	0	0
Burundi	4,800	0	0	0	0	1.9	4	4e	0	0	0	0	0	0
Cameroon	8,600	0	0	0	0	7.7	30	30e	0	0	0	0	0	0
Central African Rep.	2,300	0	0	0	0	1.0	1	1e	0	0	0	0	0	0
Chad	4,600	0	0	0	0	0.5	1	1e	0	0	0	0	0	0
Congo	1,600	0	0	0	0	1.4	1	1e	0	0	0	0	0	0
Egypt	49,000	16	3	190	90	21.3	292	473	62	77	139	149	47	42
Ethiopia	33,000	2	0	10e	0	1.1	16e	16e	10e	10e	6e	6e	0	0
Gabon	600	0	0	0	0	7.3	2	2e	0	0	0	0	0	0
Gambia	600	0	0	0	0	7.3	2	2e	0	0	0	0	0	0
Ghana	12,000	0	0	0	0	0.6	3	3e	0	0	0	0	0	0
Guinea	5,400	0	0	0	0	1.6	4	4e	0	0	0	0	0	0
Ivory Coast	8,200	0	0	0	0	9.4	35	35e	0	0	0	0	0	0
Kenya	17,000	5	1	90	60	14.8	61	114	58	57	63	116	55	53
Lesotho	1,400	0	0	0	0	1.6	1	1e	0	0	0	0	0	0
Liberia	1,900	0	0	0	0	1.2	1	1e	0	0	0	0	0	0
Libya	3,000	20	10	0	0	15.4	21e	21e	6e	6e	6e	6e	0	0
Madagascar	10,000	1	2	30	11	2.9	13e	13e	11	11	10	10	7	7
Malawi	6,100	0	0	0	0	4.3	12	12e	0	0	0	0	0	0
Mali	7,000	0	0	0	0	0.3	1	1e	0	0	0	0	0	0
Mauritania	1,700	0	0	0	0	5.2	4	4e	0	0	0	0	0	0
Mauritius	1,000	0	0	0	0	15.4	7	7e	0	0	0	0	0	0
Morocco	22,300	8	1	130	100	10.7	182	189	55	43	109	112	86	83
Mozambique	10,500	2	0	10e	0	4.8	23e	23e	3e	3e	3e	3e	0	0
Niger	5,500	0	0	0	0	0.4	1	1e	0	0	0	0	0	0
Nigeria	90,000	3	3	58	25	5.0	210	206e	6	44e	0	56	0	25
Rwanda	5,100	0	0	0	0	0.9	2	2e	0	0	0	0	0	0
Senegal	5,800	0	0	0	0	6.5	17	17e	0	0	0	0	0	0
Sierra Leone	3,800	0	0	0	0	1.2	2	2e	0	0	0	0	0	0
Somalia	3,800	0	0	0	0	1.2	2	2e	0	0	0	0	0	0
South Africa	24,000	17	10	1,460	1,190	129.3	1,232	1,407	985e	985e	1,205	1,386	1,185e	1,185e
Sudan	21,500	1	0	6	0	3.8	14	37	0	0	3	2	0	0
Swaziland	500	0	1	0	180	25.5	1	6	0	0	0	0	175	178
Tanzania	17,750	2	1	34	50	3.5	28e	28e	3e	3e	3e	3e	0	0
Togo	2,700	0	0	0	0	4.9	6	6e	0	0	0	0	0	0
Tunisia	6,500	5	1	35e	25e	26.5	78e	78e	40e	40e	33e	33e	30e	30e
Uganda	13,500	1	0	5	0	1.3	8e	8e	3e	3e	3e	3e	0	0
Zaire	29,000	1	0	4	0	0.8	11e	11e	3e	3e	3	3	0	0
Zambia	6,250	1	2	15	15e	11.3	32e	32e	15e	15e	12e	12e	10e	10e
Zimbabwe	8,400	3	2	83	30	19.7	74	75	46	49	60	67	26	29
Africa	**495,100**	**95**	**41**	**2,293**	**1,819**	**13.7**	**2,694**	**3,075**	**1,436**	**1,464**	**1,865**	**2,063**	**1,664**	**1,677**
WORLD TOTAL	**4,690,213**	**5,910**	**1,003**	**219,697**	**188,508**	**90.2**	**175,647**	**188,177**	**130,816**	**139,753**	**177,392**	**189,911**	**132,140**	**140,199**

TOP 27 PRODUCING NATIONS *(Continued)*

Norway

Population: 4,114,000. Per capita consumption of paper and board: 146 kg/322 lb. Paper and board mills: 23. Pulp mills: 27 (sulfate: 2; sulfite: 4; semichemical: 2; mechanical: 19).

Paper/board capacity: 1,815,000 tons **Pulp capacity:** 2,195,000 tons
Operating rate 1984: 86% **Operating rate 1984:** 85%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	1,232	1,423	120	126	959	1,118
Board	134	139	96	83	96	92
Total	**1,366**	**1,562**	**216**	**209**	**1,057**	**1,210**
Chemical woodpulp	580	655	127	111	240	259
Other pulps	1,060	1,209	11	6	295	311
Total	**1,640**	**1,864**	**138**	**117**	**535**	**570**

Poland

Population: 37,000,000. Per capita consumption of paper and board: 34 kg/75 lb. Paper and board mills: 50. Pulp mills: 20 (sulfate: 6; sulfite: 2; semichemical: 2; mechanical: 8; nonwood: 2).

Paper/board capacity: 1,365,000 tons **Pulp capacity:** 1,030,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	813	781	73	87	29	39
Board	498	457	27	38	52	56
Total	**1,231**	**1,238**	**100**	**125**	**81**	**95**
Chemical woodpulp	678	688	112	148	32	29
Other pulps	193	190	45	45	—	—
Total	**871**	**878**	**157**	**193**	**32**	**29**

Portugal

Population: 9,905,000. Per capita consumption of paper and board: 50 kg/110 lb. Paper and board mills: 95. Pulp mills: 8 (sulfate: 5; sulfite: 2; soda: 1).

Paper/board capacity: 720,000 tons **Pulp capacity:** 1,105,000 tons
Operating rate 1983: 91% **Operating rate 1983:** 117%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	408	450	59	58	47	66
Other paper and board	187	203	14	3	150	155
Total	**595**	**653**	**73**	**61**	**197**	**221**
Chemical woodpulp	1,010	1,107	20	26	641	651
Other pulps	32	48	2	2	—	—
Total	**1,042**	**1,155**	**22**	**28**	**641**	**651**

Romania

Population: 22,000,000. Per capita consumption of paper and board: 32 kg/71 lb. Paper and board mills: 20. Pulp mills: 12 (sulfate: 7; sulfite: 3; semichemical: 1; mechanical: 1).

Paper/board capacity: 900,000e tons **Pulp capacity:** 970,000e tons

(000 metric tons)

	Production		Imports		Exports	
	1983e	1984e	1983e	1984e	1983e	1984e
Paper	270	270	—	—	—	—
Other paper and board	540	540	—	—	—	—
Total	**810**	**810**	**45**	**45**	**150**	**150**
Chemical woodpulp	675	670	—	—	—	—
Other pulps	170	170	—	—	—	—
Total	**845**	**845**	**130**	**130**	**30**	**30**

South Africa

Population: 24,000,000. Per capita consumption of paper and board: 59 kg/129 lb. Paper and board mills: 17. Pulp mills: 10.

Paper/board capacity: 1,460,000 tons **Pulp capacity:** 1,190,000 tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	690	766	169	197	171	195
Board	565	623	71	83	36	68
Total	**1,255**	**1,398**	**239**	**279**	**202**	**270**
Chemical woodpulp	460	n.a.	220	n.a.	30	n.a.
Other pulps	705	n.a.	—	n.a.	363	n.a.
Total	**1,165**	**1,165**	**220**	**220**	**400**	**400**

Spain

Population: 38,000,000. Per capita consumption of paper and board: 79 kg/173 lb. Paper and board mills: 186. Pulp mills: 29 (sulfate: 14; semichemical: 1; mechanical: 9; nonwood: 6).

Paper/board capacity: 3,290,000 tons **Pulp capacity:** 1,635,000 tons
Operating rate 1984: 90% **Operating rate 1984:** 88%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	1,459	1,578	246	265	260	300
Other paper and board	1,295	1,372	167	182	128	113
Total	**2,754**	**2,950**	**413**	**448**	**388**	**413**
Chemical woodpulp	1,077	1,105	258	287	264	278
Other pulps	335	330	3	8	26	23
Total	**1,412**	**1,435**	**261**	**295**	**290**	**301**

Sweden

Population: 8,330,000. Per capita consumption of paper and board: 222 kg/489 lb. Paper and board mills: 56. Pulp mills: 56 (sulfate: 25; sulfite: 8; semichemical: 2; mechanical: 21).

Paper/board capacity: 7,670,000 tons **Pulp capacity:** 9,957,000 tons
Operating rate 1984: 93% **Operating rate 1984:** 95%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	3,793	4,160	147	152	2,728	3,083
Board	2,557	2,709	67	68	1,978	2,107
Total	**6,350**	**6,869**	**214**	**220**	**4,706**	**5,190**
Chemical woodpulp	6,628	6,976	85	102	2,644	2,742
Other pulps	2,040	2,264	25	26	435	420
Total	**8,668**	**9,240**	**110**	**128**	**3,079**	**3,162**

Taiwan

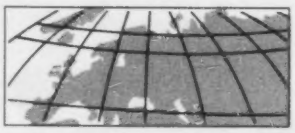
Population: 19,013,000. Per capita consumption of paper and board: 104 kg/229 lb. Paper and board mills: 149. Market pulp mills: 3* (sulfate: 1; nonwood: 2).

Paper/board capacity: 2,300,000 tons **Pulp capacity:** 600,000e tons
Operating rate 1984: 94% **Operating rate 1984:** 81%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	537	492	94	103	27	18
Board	1,183	1,437	13	46	96	78
Total	**1,720**	**1,929**	**107**	**149**	**123**	**97**
Chemical woodpulp	216	225	173	152	58	31
Other pulps	84	100	7	17	6	—
Total	**550e**	**575e**	**180**	**169**	**64**	**31**

*Market pulp only.



EUROPE

FOR MAJOR PRODUCERS in western Europe, 1984 was a good year—for many it was a record-breaker. There were several new national all-time highs for paper and board output and profit peaks for many companies. But demand began to fall away toward the end of the year, and the first half of 1985 saw generally shakier prices and some decline in shipments of major grades. The widespread economic recovery in 1984 fueled paper and board consumption (which was up 7.7% from 1983 at 50.3 million short tons), resulting in many mills running full-out, and successful price rises through the year. For some grades, particularly printing/writing grades, order backlogs built up.

With Fed. Rep. Germany alone increasing its output by 975,536 tons from 1983, total EEC production was up nearly 9% at 29.1 million tons. All paper-producing EEC members increased output; even Italy recovered from a sequence of two bad years. Pulp output was 6.56 million tons, a rise of 7.4%.

Greater demand within the EEC was the main reason for the increased output, but many countries also benefited from the growing export markets, particularly high U.S. demand. Helped by a strong dollar later in the year, the U.S. was a new sales area for many European printing/writing paper mills.

Both the U.S. and EEC markets provided Nordic producers with one of their best years, many of them making record profits. They also took considerable European market share away from North American pulp and paper exporters, partly due to favorable exchange rates.

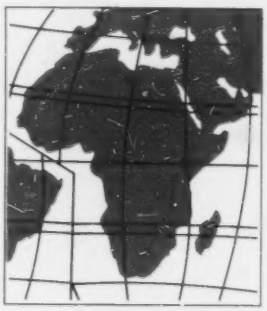
The year-end totals tell the story: exports from the three Nordic nations were just over 13.7 million tons, up 12.3% from 1983. Paperboard output was 17.3 million tons, a rise of 11.6%. Sweden alone made 551,150 tons more paper than in 1983, and its pulp exports jumped over 88,185 tons to 3.5 million.

With mills running flat-out for most of the year, Finland's paper sales organization, Finnpap (Finnish Paper Mills' Assn.) had a record year in both value and tonnage shipped. The shipments to North America alone jumped 65% to 458,557 tons, but 75% of the 5.2 million tons of Finnish paper shipped went to Europe.

Western Europe's biggest papermaking country, Fed. Rep. Germany, also had a good year, with most sectors running at capacity. Output in 1984 set a new record of 10.1 million tons, up 11% from 1983. Several trends in the German market during 1984 were common throughout Europe. More pulp came from Scandinavia (up 14%), while North American deliveries declined; paper imports rose 12%, with the EFTA countries providing 59%; domestic wastepaper consumption was up 14% at nearly 4.4 million tons and continued to be German mills' biggest raw material source.

Both Spain and Portugal had higher pulp exports during 1984, mostly to the EEC. Together the two shipped 1.05 million tons of mainly bleached eucalyptus pulp. They are both joining the EEC, effective Jan. 1, 1986, bringing membership to 12 nations, which will have a total paper/board production of around 33 million tpy.

Paper production in eastern Europe also increased in 1984, though more modestly, with total output up 3%, at 18.4 million tons. Pulp output was 14.1 million tons, up 3.3%. The dominant producer, the U.S.S.R., made 10.8 million tons of paper and board. It is intending to make much greater use of its extensive hardwood forests in the European part of the country. Of the other countries making more than 1.1 million tpy, Czechoslovakia, Dem. Rep. Germany, and Poland increased paper and board output only slightly above 1983. But Yugoslavia's production rose by 8.3%, to 1.47 million tons, despite some raw material shortages. Among other major increases was the jump in Czechoslovakia's pulp exports—largely to western Europe—by over 55,115 tons to 167,550 as production at its new market pulp mills gets underway.



AFRICA

PAPER AND BOARD output grew by 15% in 1984 to close to 2.3 million short tons. Most of this growth could be explained by a 157,600-ton rise in South Africa's production. However, long-awaited projects in other African nations are now beginning to start up.

Kenya is reported to be approaching self-sufficiency in paper and board products, and its output grew 87%, to 130,000 tons. Nigeria has started one of its three major integrated paper mill complexes, Nigerian Paper Mill Ltd.'s 110,200-tpy linerboard, corrugating medium, and kraft paper mill at Jebba.

The rise in paper and board production is the first for several years but is the herald of a much livelier African industry, dominated by the massive expansions that were completed in South Africa between late 1984 and early 1985. These not only will affect paper and board output but will make South Africa a major market pulp producer. After another static year in 1984, pulp production should rise significantly in 1985.

Both Mondi Paper Co. Ltd.'s Richards Bay and Sappi Ltd.'s Ngodwana mills are set to enter the market pulp and kraft liner markets, jointly supplying 385,800 tpy of market pulp and 165,350 tpy of packaging board when they are fully onstream in 1987. Startup market pulp tonnage from Mondi had already reached the European market by mid-1985.

During 1985 several other projects are due to come onstream, although foreign currency restrictions in many African countries are a serious drawback to buying raw materials and foreign assistance for startup and commissioning. Scarce resources tend to be allocat-

ed to projects like newsprint and packaging papers, which will, in time, save considerable amounts of foreign exchange for the countries concerned.

Southern Paper Mill's 33,000-tpy Mufindi kraft paper mill in Tanzania has commenced trials after a considerable delay, making printing/writing and kraft papers. Two Egyptian printing and writing paper projects at National Paper Co. and Ratka are scheduled for completion during the year. There is also considerable confidence that Nigerian Newsprint Mills will start production during the year. In the longer term, Zimbabwe is conducting a feasibility study into an integrated mill, based on local hardwood plantations.

Many of the long-delayed African projects finally seem to be approaching completion. Whether they will reach startup and commissioning will depend on the priority given by governments to the industry during the allocation of foreign exchange reserves.

TOP 27 PRODUCING NATIONS *(Continued)*

United Kingdom

Population: 55,950,000. Per capita consumption of paper and board: 134 kg/295 lb. Paper and board mills: 95. Pulp mills: 3 (semichemical: 2; mechanical: 1).

Paper/board capacity: 3,766,000 tons **Pulp capacity:** 196,000 tons
Operating rate 1984: 95% **Operating rate 1984:** 97%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	1,464	1,665	2,728	2,943	179	232
Other paper and board	1,745	1,842	1,557	1,585	245	301
Total	**3,209**	**3,507**	**4,285**	**4,528**	**424**	**533**
Chemical woodpulp	n.a.	n.a.	1,339	1,383	1	3
Other pulps	n.a.	n.a.	144	253	—	3
Total	**173**	**190**	**1,483**	**1,636**	**1**	**6**

United States

Population: 235,000,000. Per capita consumption of paper and board: 287 kg/633 lb. Paper and board mills: (1982) 581. Pulp mills: (1982) 195 (sulfate: 120; sulfite: 20; semichemical: 41; mechanical: 47).

Paper/board capacity: 65,998,000 tons **Pulp capacity:** 51,837,000 tons
Operating rate 1984: 94% **Operating rate 1984:** 91%

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	29,793	31,228	7,787	9,528	721	760
Board	29,190	31,079	152	220	2,853	2,659
Total	**58,983**	**62,307**	**7,939**	**9,748**	**3,574**	**3,419**
Chemical woodpulp	41,920	44,280	3,372	3,693	2,713	2,716
Other pulps	5,742	6,114	341	380	593	544
Total	**47,662**	**50,394**	**3,713**	**4,073**	**3,306**	**3,260**

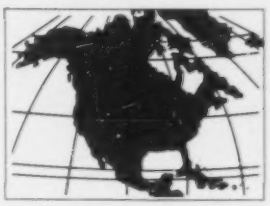
U.S.S.R.

Population: 274,000,000. Per capita consumption of paper and board: 34 kg/75 lb. Paper and board mills: 84. Pulp mills: 57.

Paper/board capacity: 10,500,000e tons **Pulp capacity:** 9,500,000e tons

(000 metric tons)

	Production		Imports		Exports	
	1983	1984	1983	1984	1983	1984
Paper	5,669	5,860e	441	399	662	665
Board	3,889	3,965	270e	270e	380e	380e
Total	**9,558**	**9,825**	**711**	**669**	**1,042**	**1,045**
Chemical woodpulp	6,251	6,602e	275e	300e	955e	1,055e
Other pulps	1,662	1,550e	—	—	—	—
Total	**7,913**	**8,152**	**275e**	**300e**	**950e**	**1,000e**



NORTH AMERICA

THE ECONOMIC RECOVERY in the U.S., which began in mid-1983, continued through much of 1984 and brought the North American pulp and paper industry to all-time production records. 1984's 84.3 million short tons of paper and board was 5.8% higher than the previous record of 79.7 million tons in 1983. Healthy rises in profits were posted by many companies in both the U.S. and Canada.

In the U.S., strong gains by newsprint and printing/writing grades helped set the record for paper and board production at 68.7 million tons, 5.6% above the previous record year, 1983. The industry's operating rate was up to 94.4% from 91.4% the previous year. Total pulp output increased by 5.7% to 55.5 million tons, while market pulp rose 6.4% to a new record at 6.9 million tons.

Demand in the coated paper market was exceptionally strong, with domestic supply being augmented by imports equivalent to 10% of U.S. production. Newsprint imports rose 14% and there were some indications that Nordic producers were planning to become permanent suppliers to the U.S. market.

The Canadian industry, operating at 90% of capacity, produced a record-high 23.3 million tons of pulp and paper, 2.5% above the previous record of 21.7 million tons in 1980. Total paper and board production was up 6.5% to 15.6 million tons, and exports were up 7%. Total newsprint production reached a record 9.9 million tons while exports were 8.8 millions tons, a 6.6% rise, although overseas exports fell by 5%. Printing/writing production was up 13%, and exports up 17%.

Total pulp and paper production in the second half of the year was 5% higher than in the first half, which largely reflects the ten-week work stoppage at British Columbian mills. Exports of woodpulp actually declined by 1% to 7.4 million tons. This was thought to be due to the modest 1% growth in world market pulp demand last year, the British Columbian labor problems, and the high value of the U.S. dollar.

Canada continued its fight against EEC attempts to limit non-EFTA duty-free newsprint to 500,000 metric tpy (551,000 short tpy). In early 1985 the quota was raised to 650,000 metric tons (716,500 short tons). Non-EFTA shipments of newsprint to the EEC were 589,730 tons in 1984, of which 474,000 tons came from Canada.

With the general slowing of business activity in first-quarter 1985, this year's outlook is less optimistic than last year's. Total paper and paperboard demand should show a modest gain over 1984, but there is growing concern about the large U.S. trade and budget deficits.

ITT Rayonier's president and CEO talks about specialty pulp markets

R.M. Gross of ITT Rayonier discusses restructuring of the dissolving pulp industry and worldwide trends in fluff and paper-grade pulp markets

By WILLARD MIES, Executive News Editor

■ In a recent interview with Pulp & Paper, ITT Rayonier Inc.'s president and CEO, Ronald M. Gross, talked about his company's pulp production capabilities and changing trends in the dissolving and fluff pulp markets. Dissolving pulp demand in recent years has been declining, resulting in considerable overcapacity worldwide. Fluff pulp consumption, however, has continued to grow faster than the demand for market pulp used in paper products.

ITT Rayonier produces all three major types of pulp at its four mills located at Fernandina Beach, Fla.; Jesup, Ga.; Hoquiam, Wash.; and Port Angeles, Wash. Last year the company racked up sales of $683 million from sales of market pulp, silvichemicals and wood products. Profits, however, have been under pressure from the strong dollar and overcapacity in market pulp and lumber.

Gross joined ITT Rayonier as president and chief operating officer in 1978. He previously served as president and chief executive officer of Canadian Cellulose Co. Ltd. (now known as Westar Timber Ltd.) in British Columbia. His first positions in the industry between 1960-68 were held with Champion International Corp.

P&P: *What is ITT Rayonier Inc.'s overall pulp production vs capacity? And can you divide capacity between dissolving, fluff, and paper-grade pulps?*

Gross: Total production last year was 755,000 metric tons vs capacity of 900,000 metric tons. It is difficult to divide capacity because, except for Grays Harbor Paper Co., our mills are flexible and able to produce a wide range of dissolving, fluff, and paper pulps. The mills' flexibility gives an advantage in shifting production to market needs.

Gross

P&P: *Hasn't Rayonier concentrated on the more profitable higher-alpha dissolving pulp grades? Aren't you also shifting more production into fluff and paper pulp grades?*

Gross: Rayonier is one of the leading producers of higher purity and more technically demanding dissolving grades. We intend to maintain this technical leadership in the future because the chemical cellulose market will continue to be very important to us.

Our markets are changing, however, and we're changing as well. Fluff pulp has been an important market for Rayonier, and it will become even more important in the future. Within the past two years we have added fluff capacity at both our Jesup and Port Angeles mills.

P&P: *What is the size and recent growth rate for the overall world dissolving pulp market?*

Gross: Traditional sources for market dissolving pulp are the Scandinavian countries, the U.S., and Canada. In the last few years South Africa has become a significant factor. Overall demand for market dissolving pulp is 1.5 million metric tpy. On a trend basis, consumption has been declining.

P&P: *Which segments of the market have shown the strongest growth and which have been declining?*

Gross: No segments of chemical cellulose markets have shown growth over the past few years except acetate for cigaret tow manufacture. We anticipate modest growth to continue in this area.

P&P: *What will be the future growth rate of the overall market?*

Gross: The production of products from wood cellulose is on the decline in North America, Europe, and Japan. Increases in rayon production in less developed countries and in the East Bloc will partially offset the decline in the primary market areas. On the other hand, many of the new rayon plants will use locally produced pulps and not traditional market sources for supply.

Overall, decline in dissolving pulp consumption will average 1% to 2%/year.

P&P: *Hasn't the flat-to-declining trend resulted in overcapacity in dissolving pulp? How has this affected dissolving pulp prices, particularly with the recent strength of the dollar?*

Gross: Without question, significant overcapacity exists within the industry. This factor, coupled with the strong dollar, has caused prices for dissolving pulp to fall, although the drop has been moderate in the more specialized, higher-purity grades. On a trend basis, we do not see a better balance between supply and demand for several years, except for periodic, cyclical improvement.

P&P: *Do you see world dissolving pulp supply and demand coming into better balance?*

Gross: An upturn in the world economy could mean improved operating rates on a cyclical basis. But this would be temporary and not change the trend or fundamental balance.

P&P: *Will the North American dissolving pulp industry face further restructuring because of excess world capacity and the strong competitive advantage of some foreign producers? Which types of dissolving pulp mills are most likely to survive?*

Gross: Over the intermediate term, we could see some restructuring of the North American dissolving pulp industry. Over the next five to ten years, some North American, European, and Japanese mills will probably close. The mills that survive will be those that can produce the product at the lowest cost or those that shift to another product base.

P&P: *Hasn't the western European dissolving pulp industry been undergoing restrcturing with something like 400,000 tpy capacity shut down in recent years?*

Gross: Most of the capacity reduction in our industry has been concentrated in Europe over the past ten to 15 years because, in a declining market, they were the high-cost producers until recently when the exchange rate shift significantly improved the European industry's cost position.

P&P: *Isn't most of the growth in dissolving pulp capacity taking place in nontraditional producing regions and the East Bloc nations? Do mills in countries like South Africa have a significant cost advantage that will enable them to dominate segments of the dissolving pulp markets?*

Gross: The answer to the first question is yes. South Africa has an advantage because of the strong dollar, as well as cheaper wood, lower labor rates, and, very importantly, virtually no environmental capital and operating costs. The cost advantages of the South African mills will permit them to increase their market share more easily than other producers.

P&P: *What is the estimated growth rate and size of the U.S. fluff pulp market? Has this growth been slowing because of the high level of market penetration by disposable baby diapers?*

Gross: World consumption of fluff is 2.2 million metric tpy. The market portion is 1.5 million metric tons, approximately. The U.S. represents a significant portion of world consumption. The growth rate has been slowing, largely because of the bigger base and already high penetration in the North American and European diaper markets.

P&P: *Do you expect use of superabsorbents in baby diapers to have much impact on fluff pulp demand? Will incontinent products (such as underpads and adult diapers) be a significant future growth area for fluff pulps?*

Gross: The future is unclear for superabsorbents. More testing is needed before they can be widely used. Some testing is going on with superabsorbents in diapers, using less fluff pulp to provide equal absorbency. Supers could have an effect, but we don't think it will be a serious one.

Adult diapers will be a significant factor and will boost fluff pulp consumption over the next ten years. At Rayonier, we have just developed a new fluff pulp that we feel is highly suited for this market.

P&P: *What is the outlook for U.S. fluff pulp exports? Any estimate of the size and growth rates for fluff pulp consumption in western Europe and Japan?*

Gross: The outlook for fluff pulp exports is very good. Current consumption in western Europe and Japan is close to 1 million metric tpy. The growth rate in Europe is estimated at 3% to 4%/year and in Japan at 6% to 7%.

P&P: *Will southern pine continue to be the preferred fluff pulp grade for most applications in disposable products? Do you see special applications for sulfite fluff?*

Gross: Southern pine kraft fluffing pulps predominate the market, but I think we are going to see more and more sulfite fluffing pulps used. Rayonier is fortunate to be in a position to supply a wide range of fiber properties to the customer not only in kraft but in sulfite as well. This positions us well to meet changing needs.

P&P: *Does CTMP have much of a future as a fluff grade?*

Gross: CTMP is used as a fluff pulp now but quantities are not great. It does, however, have growth potential. Most fluff pulp products like diapers will continue to be made with bleached chemical pulp.

P&P: *Hasn't fluff accounted for much of the growth in U.S. chemical "paper-grade" market pulp shipments? How fast has the true paper pulp consumption been*

TABLE 1: **North American dissolving pulp production—long-run declining trend (000 metric tons).**

	U.S.	Canada	Total North America
1984	1,094	221	**1,315**
1983	1,143	215	**1,358**
1982	988	219	**1,207**
1981	1,224	275	**1,499**
1980	1,366	313	**1,679**
1979	1,360	367	**1,727**
1978	1,273	334	**1,607**
1977	1,327	269	**1,661**
1976	1,243	254	**1,497**
1975	1,118	228	**1,346**
1974	1,461	351	**1,812**
1973	1,356	251	**1,607**
1972	1,519	253	**1,772**
1971	1,524	288	**1,812**
1970	1,555	326	**1,881**
1965	1,347	306	**1,653**
1960	1,019	198	**1,217**
1955	880	324	**1,204**
1950	428	293	**721**

Sources: American Paper Institute; Canadian Pulp & Paper Assn.

growing in the U.S.?

Gross: Fluff pulp has been a source of much of the growth in chemical paper grade market pulp shipments, growing at more than 8% over the last seven years. True paper pulp consumption growth has been running at 2% to 2.5% annually on a much larger base than fluff and this growth has accounted for the larger share of the increased tonnage.

P&P: *When do you see paper-grade market pulp supply and demand coming into better balance?*

Gross: After the next year or two.

P&P: *Has the market for southern pine been especially weak because of the startup of two major projects in the South last year?*

Gross: The market for southern pine is not weaker than for northern kraft, sulfite, or other pulps. Southern pine is well accepted worldwide.

P&P: *Will new paper machines being installed at market pulp mills (Georgia-Pacific Corp., Hammermill Paper Co.) help the supply/demand picture after 1985?*

Gross: The immediate effect of such shifts is difficult to predict. On one hand, some market pulp is being taken off the market. On the other, increased paper production at integrated mills has the effect of taking volume from existing paper mills, many of which use market pulp. The impact is diffused. Over the medium- and long-term, however, integration is more harmful to the pulp market; the smaller the market volume is to that paper use, the more volatile the business.

The main factor that will help the supply/demand situation beyond 1985 will be continuation of steady growth in paper products that use bleached chemical pulp.

P&P: *Isn't southern pine receiving increased acceptance by papermakers in the northern U.S., western Europe and the Far East?*

Gross: Both southern pine and hardwood are nearly fully accepted worldwide.

P&P: *Don't southern pine producers face growing competition from softwood producers in Brazil, Chile, New Zealand, and other nontraditional producing regions?*

Gross: Yes. These new sources do and will affect all types of chemical pulp, not just southern pine. If a grade is found useful for papermaking, it will find its niche.

P&P: *What is the future of sulfite as a paper-grade market pulp? Hasn't sulfite almost become a specialty market in North America?*

Gross: We see little growth for sulfite paper pulp in the future. Probably a diminution of production will take place as less efficient mills phase out. In the meantime, sulfite pulps have a place in the market for many paper and specialty end uses. It also makes very good paper.

P&P: *How would you assess the competitive posture of your various mills—Jesup, Ga.; Fernandina Beach, Fla.; Port Angeles, Wash.; and Hoquiam, Wash.?*

Gross: Within each category of pulp—kraft and sulfite and dissolving, paper and fluff pulps—Rayonier mills are competitive with other U.S. producers.

As an industry, however, the market pulp business is extremely weak and we don't expect conditions to change in the near term. Foreign producers have improved their cost-competitive position because of the strong U.S. dollar.

P&P: *What steps have you taken to improve the performance of your mills?*

Gross: The company will continue to stress cost reduction at all mills with the emphasis on wood, chemicals, labor, maintenance, productivity, health care costs, and transportation. Progress has been made and we expect it to continue.

For example, in the Northwest woods we have a system called POD, which features contractor-like crews working on an incentive basis. The employees have the opportunity to earn more, and wood costs have been lowered.

At the mills, we have new efficiency programs, which are working. In May, we negotiated a new labor agreement at Grays Harbor that includes—besides efficiency items—a two-tier pay system that reduces rates for newly hired employees. This will tend to lower labor costs over time.

Of course, we continue to emphasize quality and technical capability and we also plan to continue our strong research effort.

It was research that led us into the successful development of our chemical business which is based on upgrading pulp byproduct streams. The growth of this business has been excellent and it certainly adds to the strength of our various mills. ■

TABLE 2: **ITT at a glance.**

Pulp mills[1]	**Capacity (metric tpy)**	**Grades**
Jesup, Ga.	450,000	Kraft
Fernandina Beach, Fla.	145,000	Sulfite
Hoquiam, Wash.	150,000	Sulfite
Port Angeles, Wash.	155,000	Sulfite
Total	**900,000**	
Paper mill		
Hoquiam, Wash.[2]	100,000	Uncoated free sheet
Silvichemical plants		
Hoquiam, Wash.	153,900	Spent sulfite liquor products, vanillin, VBL (a boiler fuel)
Jesup, Ga.	31,000	Tall oil, turpentine, carbon
Port Angeles, Wash.	7,200	Bio-Protein (a feed supplement)
Total	**192,100**	

Wood products plants		
Lumber mills (4)	185	million bd ft/yr
Treated wood plants (6)	22.1	million ft³/yr
Plywood plants (1)	90	million ft²

Timber resources	**Acres owned**	**Leased/ licensed**	**Total**
Northwest	360,000	69,000	**429,000**
Southeast	739,000	168,000	**907,000**
Total U.S.	**1,099,000**	**237,000**	**1,336,000**

1. All of the mills make dissolving or paper-grade market pulp (including fluff) except for Port Angeles, which has been supplying most of its output to adjacent Grays Harbor Paper Co., the idle Port Cartier, Que., dissolving pulp mill is held directly by ITT.
2. Grays Harbor Paper is jointly owned by ITT Rayonier Inc. and Hammermill Paper Co.

Source: Based on ITT Rayonier data for 1984.

Maintenance is no prize assignment

April's Engineer to Engineer column ran a survey questioning readers on the differences between engineering and maintenance departments. The results of that survey are printed below. As always we thank those of you who took the time to respond.

More than half of the responses (55%) were from mill engineers. Supervisory personnel made up the second largest group (28%). The majority of the supervisors indicated an engineering background. The engineers were predominantly assigned to the mill engineering department.

There were some interesting splits on whether or not maintenance-related projects were helpful in gaining recognition. With the responses only slightly tipped in favor of maintenance projects, a breakout of supervisors' responses was done. The supervisors' responses, too, were almost equally split: 57% yes, 43% no. It appears that a significant block of engineers in the industry feel that maintenance-related assignments are less rewarding than others. Visibility is still important, since few people enjoy working "alone in the dark."

In a related question that asked if maintenance projects had a negative connotation, 35% of the respondents said yes. In the supervisors' breakout, 29% also said yes. If close to a third of the supervisors who make assignments feel that maintenance is not as important as other projects, it is not surprising that engineers also feel this way. It would be interesting to know at what management level this attitude starts.

The combined response to the question about conflict between engineers working on joint maintenance/engineering department projects showed that 47% felt that interdepartmental conflicts exist, and 53% felt that they do not not. Only 25% of those in supervisory positions felt that conflicts exist. The responses for engineers only showed that 66% thought conflict does arise, while only 34% said it does not. These responses raise questions as to whether managers deny problems, or if engineers are overly sensitive to the give-and-take of a mill environment.

Some responses are printed below.

"I find that when there are engineers in both areas, the maintenance engineer ends up doing the engineering function and not maintenance; therefore 'maintenance engineering' is really a misnomer."

—Supervisor

"More engineers should be used in all departments, not just engineering! Today engineering talent can be (and should be) used in all operations and maintenance departments. Engineers should not be confined to the engineering department any more than chemists should only work in the lab!

—Division Manager

MATT COLEMAN ***is engineering editor for*** **Pulp & Paper.** ***Comments should be addressed to him at:*** **Pulp & Paper,** ***2700 Cumberland Parkway, N.W., Suite 530, Atlanta, Ga. 30339.***

Are you a

0%	Technician
55%	Engineer
28%	Supervisor
17%	Other

If you are an engineer and not a supervisor, are you assigned to the

64%	Mill engineering department
27%	Mill maintenance department
9%	Operations department

At your mill are engineers assigned to

17%	Engineering department only
83%	Both engineering and maintenance departments
0%	Neither, engineering and maintenance departments are one and the same

Do conflicts arise when both the maintenance and engineering departments have full-time engineers working in them?

47% Yes **53%** No

As an engineer, do you feel that maintenance engineering or maintenance-related projects are as helpful in gaining recognition and promotion within the company as expansion- or production-related projects?

56% Yes 44% No

Would the maintenance department at your mill be more efficient if contract maintenance were used?

26%	Yes
53%	No
21%	Already using contract maintenance

If your mill has separate engineering and maintenance staffs, what percentage of time does the engineering department spend working on maintenance-related projects?

11%	0% to 5%	22%	40% to 60%
44%	5% to 20%	6%	60% +
17%	20% to 40%		

As an engineer, does working on "maintenance" have a negative connotation at your mill?

35% Yes **65%** No